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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,086	09/05/2003	Yong-Chul Park	50736/DBP/Y35	9934

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EXAMINER

WEINER, LAURA S

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,086

Applicant(s)

PARK ET AL.

Examiner

Laura S. Weiner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 14-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-13 and 31-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9-03; 8-05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-19, 31-34 in the reply filed on 12-20-05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. The elected species was an electrolyte comprising an additive comprising a sulfone-based compound of Formula (1) and a C3-C30 organic peroxide. Therefore, claims 1-7, 9-13 have been examined.
3. Claims 20-30 and 8, 14-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 12-20-05.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-7, 9-13, 31, 33-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al. (US 2003/0190529).

Kim et al. teaches on page 9, claims 1, 3-4, an electrolyte for a lithium battery comprising a nonaqueous organic solvent, a lithium salt and an additive comprising a sulfone-based compound, a poly(ester)(metha)acrylate, a polymer of a poly(ester)(metha)acrylate and mixtures thereof where the sulfone compound is represented by formula (2) such as methyl sulfone, vinyl sulfone, etc. Kim et al. teaches in claim 6, that the sulfone compound is added in an amount of 0.01-10 wt%. Kim et al. teaches in claims 14-15, that the electrolyte further comprises an organic peroxide in an amount of 0.3-5 parts by weight on the basis of 100 parts by weight of the poly(ester)(metha)acrylate. Kim et al. teaches in claim 16, that the organic peroxide can be isobutyl peroxide, lauroyl peroxide, benzoyl peroxide, etc. Kim et al. teaches in claims 21-22, that the lithium salt comprises LiPF₆, LiBF₄, etc. in a concentration of 0.6-2.0 M. Kim et al. teaches in claims 23-24, that the organic solvent is a carbonate such as DMC, DEC, MPC, EC, PC, etc. Kim et al. teaches on page 7, Example 1, a lithium secondary battery comprising a positive electrode comprising LiCoO₂, a negative electrode comprising mesocarbon and the electrolyte.

6. Claims 1-7, 9-13, 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al. (US 2004/0029018).

Kim et al. teaches on page 7, claims 1, 6, 10-11, 13 and on page 4, a

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nonaqueous electrolytic solution comprising a lithium salt, an organic solvent, a polyester (meth)acrylate, 0.3-5 parts by weight per 100 parts to weight of the polyester (meth)acrylate and further comprising 0.1-10 parts by weight of a methyl sulfone, a vinyl sulfone, etc. Kim et al. teaches on page 4, [0054-0056], that the electrolyte comprises the polyester (meth)acrylate, the organic peroxide and the sulfone compound in addition to at least one 0.6-2.0 M LiPF₆, LiBF₄, etc. and an organic solvent comprising EC, PC, DMC, EMC, etc. Kim et al. teaches on page 6, Example 1, a battery comprising a LiCoO₂ cathode, a MCF anode and an electrolyte.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 6-7, 9-13, 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung et al. (US 2003/0157411) in view of Kim et al. (2001/0009744).

Jung et al. teaches on page 8, claim 1, a polymer electrolyte comprising includes polyester (meth)acrylate having a polyester polyol moiety having three or more hydroxide (-OH) groups, a peroxide and an electrolytic solution including a lithium salt and an organic solvent and on page 9, claim 11, that the polymer electrolyte comprises an organic solvent, comprising EC, sulfolane [*a sulfone-based compound*]. Jung et al. teaches in claim 11, that the solvent can be VC, BC, EC, DEC, etc. Jung et al. teaches

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on page 5, [0066], that a fluorinated aromatic hydrocarbon compound may be further included as the organic solvent. The fluorinated aromatic hydrocarbon compound can be 2-fluorotoluene, 3-fluorotoluene, 4-fluorotoluene, etc. Jung et al. teaches on page 9, claims 6-7, that the peroxide is isobutyl peroxide, lauroyl peroxide, etc. and can be present 0.3-5 parts by weight based on 100 parts by weight of polyester(meth)acrylate or its polymer. Jung et al. teaches on page 9, that a lithium battery comprises the electrolytic solution. Jung et al. teaches on page 5, [0074], that the lithium battery comprises a cathode comprising lithium composite oxide or a transition metal compound.

Jung et al. teaches the claimed invention as explained above except does not teach that the sulfone-based compound is $R_1-O-S(=O)_2-O-R_2$ cited as Formula 1 but instead teaching a sulfolane and does not teach that the cathode is a lithium nickel based oxide.

Kim et al. teaches on page 2, [0021-0025], an electrolyte for a lithium secondary battery comprising a nonaqueous carbon solvent and a sulfone based organic compound represented by Formula (I), Formula (II) and Formula (III) where R and R' are independently selected from the group of primary, secondary or tertiary alkyl group, etc. Kim et al. teaches on page 3, Table 1, that the sulfone based organic compound of formula (I) can be methyl sulfone, vinyl sulfone, etc. Kim et al. teaches on page 5, that the sulfone based organic compound can also be formula (II) which can be sulfolane (a five membered ring with the $O=S=O$ bond connected to the ring. Kim et al. teaches on page 3, [0028], that the cathode can be a lithium transition metal oxide such as $LiCoO_2$,

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LiNiO₂, LiNiCoMO₂, etc. and teaches that the anode can be crystalline or amorphous carbon such as mesocarbon fiber (MCF), carbon composite, etc.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the sulfone based organic compound of formula (I), a methyl sulfone, a vinyl sulfone, etc. taught by Kim et al. instead of the sulfolane compound taught by Jung et al. because Kim et al. teaches that either sulfone base organic compound can be used in a lithium secondary battery comprising a nonaqueous carbonate electrolyte and one would expect therefore to get similar results.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use LiNiO₂ or LiNiCoMO₂ taught by Kim et al. instead of LiCoO₂ taught by Jung et al. because Kim et al. teaches that either LiNiO₂ or LiNiCoMO₂ or LiCoO₂, can be used in a lithium secondary battery comprising a nonaqueous carbonate electrolyte and one would expect therefore to get similar results.

Information Disclosure Statement


9. The information disclosure statement filed 9-5-03 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Laura S Weiner
Primary Examiner
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February 2, 2006